

MEMORANDUM FOR: Area Governments

FROM: 509 BW/CC

509 Spirit Blvd, Suite 509  
Whiteman AFB MO 65305

SUBJECT: Air Installation Compatible Use Zone (AICUZ) Study

1. This Air Installation Compatible Use Zone (AICUZ) Study for Whiteman Air Force Base is an update of the original April 1976 AICUZ Study and the Community Coordination Plan from November 1987 as well as the B-2 Environmental Impact Study from September 1992. The update was initiated because of changes in the types of aircraft assigned to Whiteman, flight track changes, and improvements in noise mapping software. It is a reevaluation of aircraft noise and accident potential related to Air Force flying operations. It is designed to aid in the development of local planning mechanisms which will protect public safety and health, as well as preserve the operational capabilities of Whiteman AFB.
2. The enclosed report contains a summary description of the affected area around the base. The report outlines the location of runway clear zones, aircraft accident potential zones, noise contours, and recommends compatible land uses for areas in the vicinity of the base. It is our hope that this information will be incorporated into your community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.
3. The basic objective of the AICUZ program is to achieve compatible uses of public and private lands in the vicinity of military airfields by controlling incompatible development through local actions. This update provides noise contours based upon the Day-Night Average A-Weighted Sound Level (DNL) metric used by the Air Force. It provides the information necessary to maximize beneficial use of the land surrounding Whiteman Air Force Base while minimizing the potential for degradation of the health and safety of the affected public.
4. We greatly value the positive relationship Whiteman AFB has experienced with its neighbors over the years. As a partner in the process, we have attempted to minimize noise disturbances through such actions as confining most flight operations and ground engine runups to the hours between 7:00 a.m. and 10:00 p.m. and avoiding flights over noise-sensitive locations. In addition, Whiteman AFB has spent approximately \$500,000 on sound suppression equipment to muffle the noise of ground engine runups. We solicit your cooperation in implementing the recommendations and guidelines presented in this AICUZ report.

CHRISTOPHER D. MILLER, Brig Gen, USAF  
Commander

**WHITEMAN AFB, MO**

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**WHITEMAN AFB AICUZ STUDY**

**VOLUME I**

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## SECTION 1: PURPOSE AND NEED

### 1.1 Introduction

This study is an update of the Whiteman AFB Air Installation Compatible Use Zone (AICUZ) Study. The update presents and documents the changes to the AICUZ for the period of 1976 to 2005. It reaffirms Air Force policy of promoting public health, safety, and general welfare in areas surrounding Whiteman AFB. The report presents changes in flight operations since the last study and provides current noise contours and compatible use guidelines for land areas surrounding the base. It is hoped this information will assist local communities and serve as a tool for future planning and zoning activities.

The changes in the AICUZ are attributed to: The addition, elimination, and alteration of flight tracks for mission purposes, to avoid

- overflying populated areas, and to reduce noise impacts on surrounding communities.
- The basing of B-2, T-38, A/OA-10 and AH-64 aircraft at Whiteman AFB.
- The departure of many of the aircraft active at Whiteman AFB at the time of the 1976 AICUZ, including the T-39, L-188, C-9, C-130, and B-52.
- Technical improvements to the NOISEMAP program.

### 1.2 Purpose and Need

As stated in the 1976 Whiteman AFB AICUZ Study, the purpose of the AICUZ program is to promote compatible land development in areas subject to aircraft noise and accident potential. As the town of Knob Noster and Johnson County prepare and modify their land use development plans, recommendations from this updated AICUZ study should be included in their planning process to prevent incompatibility that may compromise Whiteman AFB ability to fulfill its mission requirements. Accident potential and aircraft noise should be major considerations in their planning process.

In 1987, the Air Force released to the public the Community Coordination Plan that provided additional aircraft noise information. Then in 1992, the Air Force released to the public the Environmental Impact Statement defining the environmental and socioeconomic impacts of basing the B-2, T-38 and A-10 at Whiteman. This study is necessary to continue to provide the Whiteman communities and their leader's data on aircraft noise and accident potential to use in their planning processes.

Air Force AICUZ land use guidelines reflect land use recommendations for clear zones, accident potential zones I and II, and four noise zones. These guidelines have been established on the basis of studies prepared and sponsored by several federal agencies, including the Department of Housing and Urban Development, Environmental Protection Agency, Air Force, and state and local agencies. The guidelines recommend land uses which are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. The Air Force has no desire to recommend land use regulations which render property economically useless. It does, however, have an obligation to the inhabitants of the Whiteman AFB environs and to the citizens of the United States to point out ways to protect the people in adjacent areas, as well as the public investment in the installation itself.

The AICUZ program uses the latest technology to define noise levels in areas near Air Force installations. An analysis of flying operations was performed, including types of aircraft, flight patterns utilized, variations in altitude and power settings, number of operations, and hours of operations. This information was used to develop the noise contours contained in this study. The DoD NOISEMAP methodology and the Day-Night Average A-Weighted Sound Level (DNL) noise metric were used to define the noise zones for Whiteman AFB.

### **1.3 Process and Procedure**

Preparation and presentation of this update to Whiteman AFB's AICUZ Study is part of the continuing Air Force participation in the local planning process. It is recognized that, as local communities prepare land use plans and zoning ordinances, the Air Force has the responsibility to provide inputs on its activities relating to the community. This study is presented in the spirit of mutual cooperation and assistance by Whiteman AFB to aid in the local land use planning process. This study updates information on base flying activities since 1976. Noise contours and AICUZ maps in this study are based on current mission plans.

Data collection was conducted between 17 – 21 May 2004. Aircraft operational and maintenance data were obtained to derive average daily operations by runway and type of aircraft. This data is supplemented by flight track information (where they fly), flight profile information (how they fly), and ground runup information. After verification for accuracy, data was input into the NOISEMAP program and converted to Day-Night Average A-Weighted Sound Level (DNL) noise contours. Contours were plotted on an area map and overlaid with clear zones and accident potential zones. Appendix A of Volume II contains detailed information on the development of the AICUZ program.

## **SECTION 2: INSTALLATION DESCRIPTION**

Whiteman AFB occupies 4,183 acres in Johnson County, Missouri, 2 miles south of Knob Noster, 10 miles east of Warrensburg and 65 miles southeast of Kansas City (Figure 1). The host unit at Whiteman Air Force Base, Mo., is the 509th Bomb Wing (BW), which falls under Air Combat Command (ACC). The tenant units include the Air Force Reserve Command (AFRC) 442nd Fighter Wing (FW), the Missouri Army National Guard (MOANG) 1st Battalion, 135th Aviation unit, the Navy Reserve Mobile Inshore Undersea Warfare Unit-114 (MIUWU) and Joint Fires Network Unit 1.

### **2.1 Mission**

The primary mission at Whiteman AFB is to maintain pilot proficiency and a state of combat readiness in the resident B-2 bomber (509 BW), A-10 tank-killer (AFRC 442d FW), and AH-64 Apache helicopter (MOANG 135th Aviation) units. This is accomplished through daily training missions flown from the airbase.

The 509 BW is home to 21 B-2 Spirit bombers. Flown by members of the 325th and 393rd Bomb squadrons, the B-2 uses stealth technology to penetrate air defenses undetected and attack enemy tactical and strategic targets with both conventional and nuclear ordnance. The four-engine aircraft carries a crew of two, and can reach anywhere in the world at high sub-sonic speeds.

The 394th Combat Training Squadron utilizes 13 T-38 aircraft to produce mission-ready B-2 crews, starting with initial B-2 qualification and continuing on to upgrade training. The 509 BW also provides logistics support for the AFRC's 442 FW and MOANG's 1st Battalion, 135th Aviation.

The 442d FW supports, maintains and flies the A-10 and OA-10 Thunderbolt II for a total of 17 aircraft. The A-10, better known as the Warthog or "tank killer", employ's numerous weapons, most notably a 30mm cannon to fend off attacking ground forces, specifically armored vehicles.

The 1st Battalion, 135th Aviation "First Attack Team" is composed of a variety of units ready to respond to any emergency and to act in the defense of the nation. The unit supports, maintains and flies 24 AH-64 Apaches.

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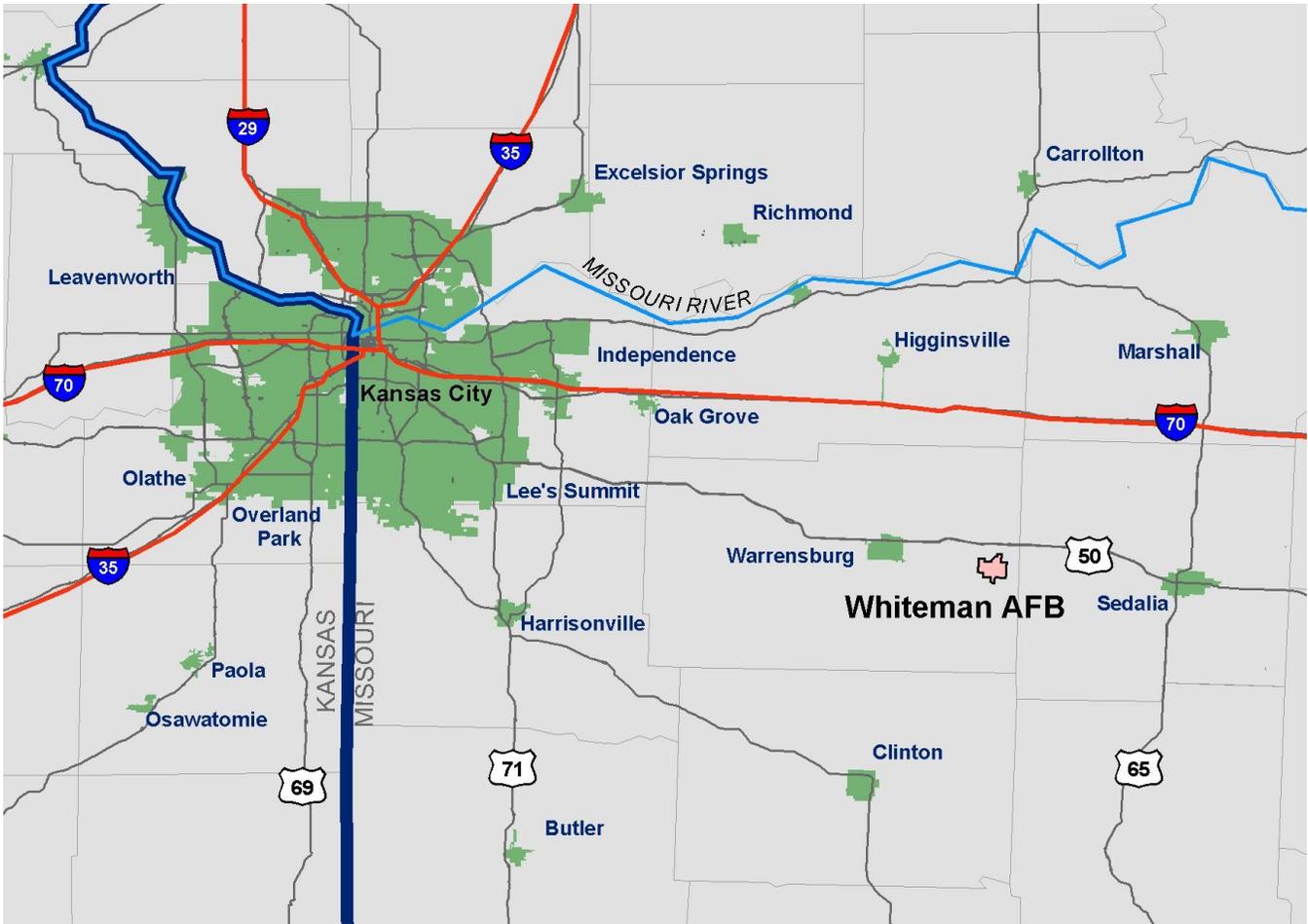


Figure 1, VICINITY

## 2.2 Economic Impact

The economic impact region (EIR) covers a radius of fifty miles around the base (Economic Resource Impact Statement, Whiteman AFB 2004). The primary region of influence (ROI), based upon base personnel residence trends, includes Johnson, Pettis, and Henry Counties. In 2004, approximately 59% of military personnel and dependants lived off-base. The majority lived in Johnson County and the remainder lived in Pettis, Henry and other nearby counties.

In 2004, the base had 6,187 employees, including 707 civilian and contract employees, 3,846 active duty military and 1,634 military reserve personnel. The base supported approximately 5,394 active duty military dependents. Additionally, the base supports 3,617 military retirees living in the region of influence. Base personnel are broken down by classification and housing in Table 2-1. The annual payroll for those base personnel totals \$228,100,441. It is broken down by classification in Table 2-2.

**Table 2-1 PERSONNEL BY CLASSIFICATION AND HOUSING (2004)**

CLASSIFICATION	LIVING ON-BASE	LIVING OFF-BASE	TOTAL
<b>ACTIVE DUTY MILITARY</b>	1,340	2,506	3,846
<b>ARNG / RESERVE</b>	1	890	891
<b>NON-EXTENDED ACTIVE</b>	0	736	736
<b>NAVY</b>	3	4	7
<b>TOTAL MILITARY</b>	<b>1,344</b>	<b>4,136</b>	<b>5,480</b>
<b>APPROPRIATED FUND CIVILIAN</b>			
General Schedule			442
Federal Wage Board			260
Other			5
<b>NON-APPROPRIATED FUND, CONTRACT CIVILIANS, AND PRIVATE BUSINESS</b>			
Civilian NAF			177
Civilian BX			97
Contract Civilians			925
Private Businesses On-base			165
<b>TOTAL CIVILIAN</b>			<b>2,071</b>
<b>GRAND TOTAL PERSONNEL</b>	<b>1,344</b>	<b>4,136</b>	<b>7,551</b>

Source: Whiteman AFB Economic Resource Impact Statement, Fiscal Year 2004

**Table 2-2 SUMMARY OF ANNUAL GROSS PAYROLL (2004)**

<b>CLASSIFICATION</b>	<b>TOTAL</b>
<b>ACTIVE DUTY MILITARY</b>	\$ 159,608,858
<b>ARNG / RESERVE</b>	\$ 1,252,276
<b>NON-EXTENDED ACTIVE</b>	\$ 9,189,690
<b>TOTAL MILITARY</b>	<b>\$ 170,050,824</b>
<b>APPROPRIATED FUND CIVILIAN</b>	
General Schedule	\$ 31,054,249
Federal Wage Board	\$ 15,095,718
Other	\$ 94,934
<b>NON-APPROPRIATED FUND, CONTRACT CIVILIANS, AND PRIVATE BUSINESS</b>	
Civilian NAF	\$ 2,786,792
Civilian BX	\$ 1,478,761
Private Businesses On-base	\$ 7,539,163
<b>TOTAL PAYROLL</b>	<b>\$ 228,100,441</b>

Source: Whiteman AFB Economic Resource Impact Statement, Fiscal Year 2004

In Fiscal Year 2004, Whiteman AFB expenditures exceeded \$100,000,000, summary in table 2-3. In addition to direct spending, it is estimated that for every base employee, there is an induced number of indirect jobs generated in the local economy, resulting in a total economic impact of \$412,957,283.

**Table 2-3 SUMMARY OF CONSTRUCTION, CONTRACTS AND EXPENDITURES FOR MATERIALS, EQUIPMENT AND SUPPLIES (2004)**

<b>VARIABLE</b>	<b>ACTUAL ANNUAL EXPENDITURE</b>
<b>CONSTRUCTION</b>	
Military Construction Program	17,062,000
NonAppropriated Fund	6,600,000
Military Family Housing	19,481,000
Operations & Maintenance	12,457,437
Other	1,866,026
<b>SERVICES</b>	
Utilities	6,417,167
Service Contracts	6,975,383
Other Services	1,266,127
<b>MATERIALS, EQUIPMENT AND SUPPLIES PROCUREMENT</b>	
Commissary	640,000
Base Exchange	498,223
Heath	18,592,936
Education	7,322,640
TDY	829,028
Other Material & Supplies	995,035
<b>TOTAL EXPENDITURES</b>	<b>101,003,002</b>

Source: Whiteman AFB Economic Resource Impact Statement, Fiscal Year 2004

### **2.3 Flying Activity**

To describe the relationship between aircraft operations and land use, it is necessary to fully evaluate the exact nature of flying activities. An inventory has been made of such things as the types of aircraft operating at Whiteman and includes information on where and how they fly, at what time of day, and how often over a given area these aircraft operate.

The principal aircraft operating from Whiteman AFB and the average number of daily operations for each aircraft are shown below. An operation is defined as one departure, one approach, or half a closed pattern. A closed pattern consists of both a departure portion and an approach portion--i.e. two operations.

<u>TYPE OF AIRCRAFT</u>	<u>AVERAGE DAILY OPERATIONS</u>
B-2	41
T-38	54
A-10	26
AH-1	41

In addition to these assigned aircraft, numerous transient aircraft from other military installations land and take off from Whiteman AFB. An average of 94 operations will be carried out daily by transient aircraft.

Whiteman AFB aircraft use the following basic flight patterns:

- Straight-out departure.
- Straight-in approach.
- Overhead landing pattern.
- Instrument flight rules (IFR) closed pattern.
- Visual flight rules (VFR) closed pattern.
- Rectangular VFR closed pattern.

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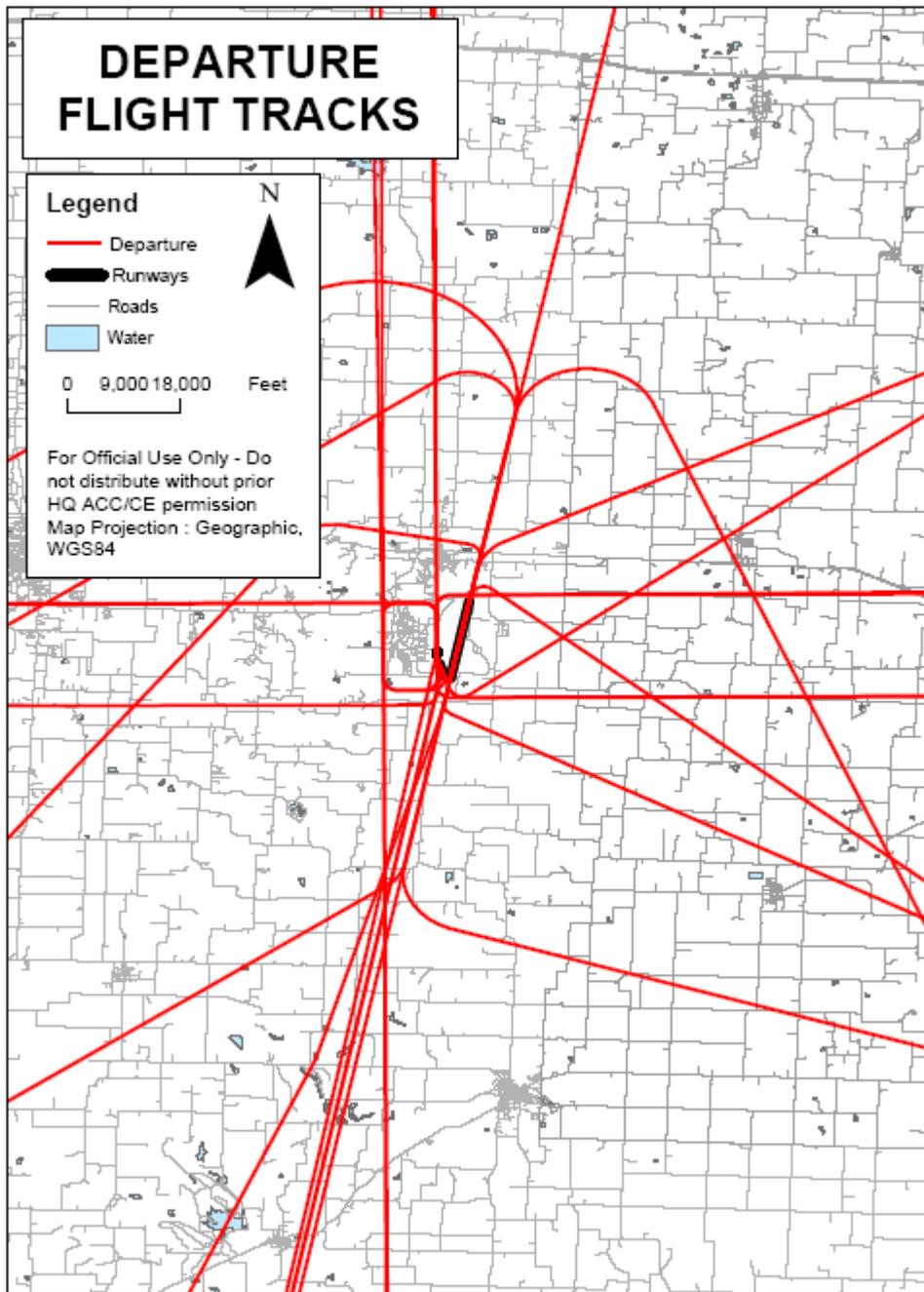
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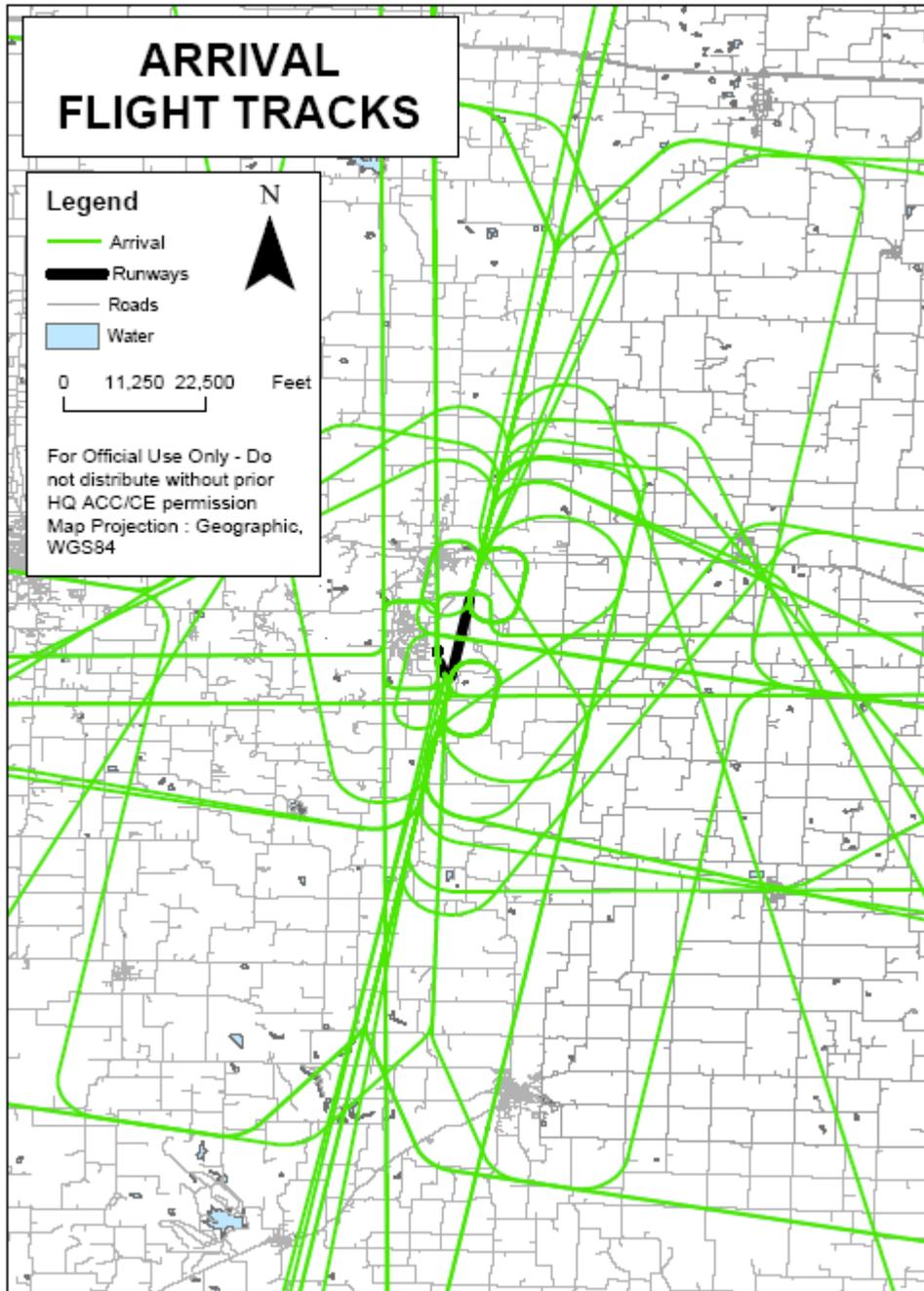
Whiteman AFB flight patterns (Figures 2-4) result from several considerations, including:

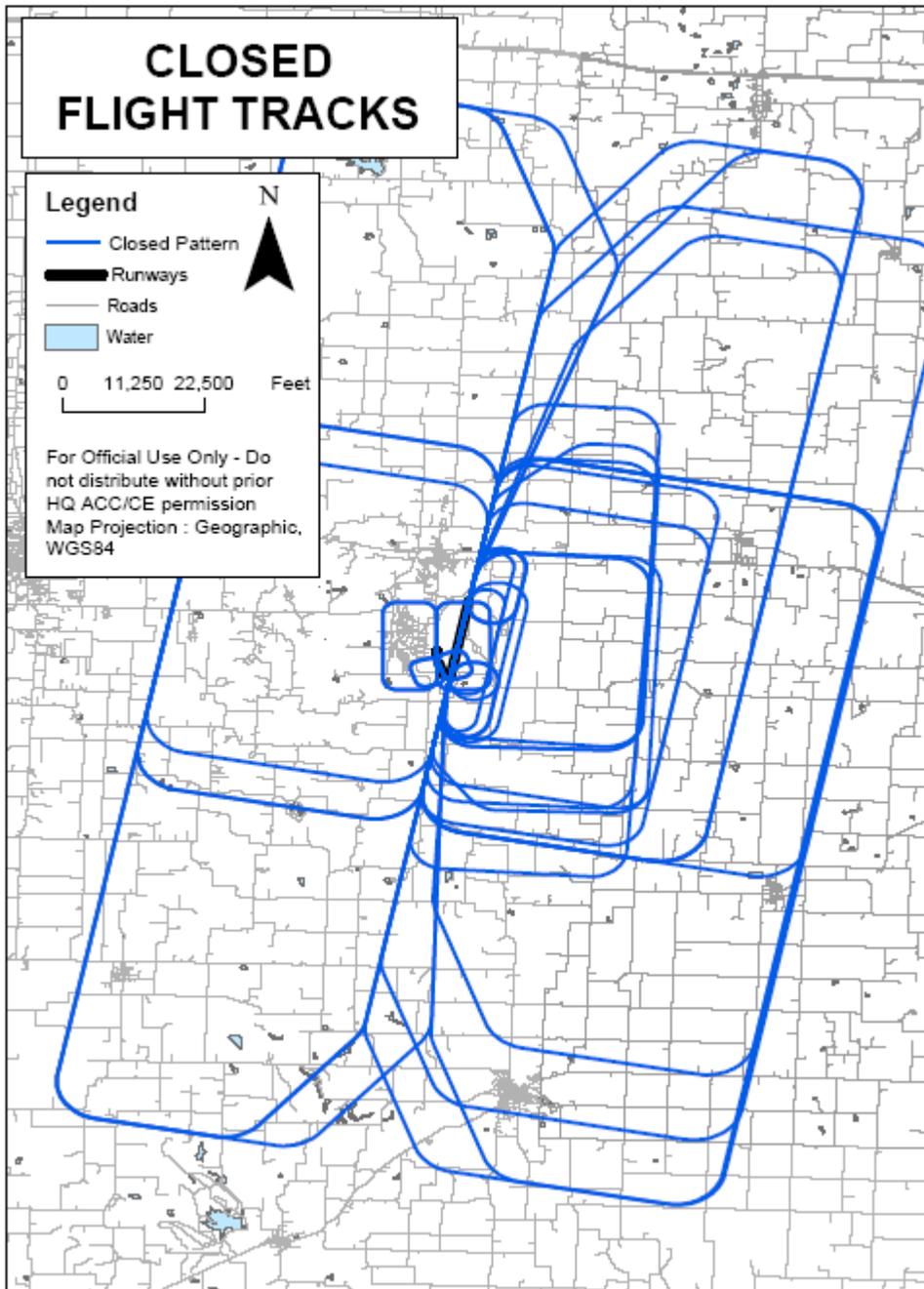
- Takeoff procedures to avoid heavily populated areas as much as possible.
- Air Force criteria governing the speed, rate of climb, and turning radius for each type of aircraft.
- Efforts to control and schedule missions to keep noise levels low, especially late at night.
- Coordination with the Federal Aviation Administration (FAA) to minimize conflict with civilian aircraft operations.

To the maximum extent possible, engine runup locations have been established in areas that minimize noise for people on base, as well as for those in the surrounding communities. Normal base operations do not include late night engine runups, but heavy work-loads or unforeseen contingencies sometimes require a limited number of nighttime engine runups.

Airfield environs planning is concerned with three primary aircraft operational/land use determinants: (1) accident potential to land users, (2) aircraft noise, and (3) hazards to operations from land uses (height obstructions, etc.). Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operation to determine the optimum flight track for each aircraft type. The flight tracks depicted in the following Figures are the result of such planning.







## SECTION 3: LAND USE COMPATIBILITY GUIDELINES

### 3.1 Introduction

The Department of Defense (DoD) developed the Air Installation Compatible Use Zone (AICUZ) program for military airfields. This program works to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting the public health, safety, and quality of life. The goal is to promote compatible land use development around military airfields by providing information on aircraft noise exposure and accident potential.

To achieve this goal the AICUZ report describes three constraints to development that affect, or result from flight operations. The first constraint involves areas which the Federal Aviation Administration (FAA) and DoD have identified for height limitations. The Air Force's obstruction criteria are based upon the Federal Aviation Regulation Part 77 under Subpart C (see Height and Obstruction Criteria in Volume II, Appendix D).

The second constraint involves noise zones produced by the computerized Day-Night Average A-Weighted Sound Level (DNL) metric and the DoD NOISEMAP methodology (see Description of the Noise Environment in Volume II, Appendix C). Using the NOISEMAP computer program, which is similar to FAA's Integrated Noise Model, DoD produces noise contours showing the noise levels generated by current aircraft operations. The AICUZ report contains noise contours plotted in increments of 5 dB, ranging from a DNL of 65 dB to 80+ dB. Figure 3 shows current DNL noise contours based on current operations.

The third constraint involves accident potential zones (APZ), these zones illustrate where aircraft accidents are most likely to occur. DoD analysis has confirmed that the areas immediately beyond the ends of runways and along the approach and departure flight paths are the most hazardous, and have divided the area into three zones each having its own regulation or suggested regulation to development. The clear zone, the area closest to the runway end, is the most hazardous. The overall risk is so high that DoD generally acquires the land through purchase or easement to prevent development. At Whiteman AFB, 41 percent of the clear zone property is located off base and is subject to restrictive easements. APZ I is an area beyond the clear zone that possesses a significant potential for accidents. APZ II is an area beyond APZ I having measurable potential for accidents. While aircraft accident potential in APZs I and II does not warrant acquisition by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public. Whiteman AFB clear zones are 3,000 feet wide by 3,000 feet long. APZ I is 3,000 feet wide by 5,000 feet long, and APZ II is 3,000 feet wide by 7,000 feet long (Figure 3). Additional information on accident potential is contained in Volume II, Appendix B.

**Figure 3**

**NOISE ZONES AND ACCIDENT POTENTIAL ZONES**

### 3.2 Land Use Compatibility

Each AICUZ report contains land use guidelines. Figure 4 lists land uses versus all possible combinations of noise exposure and accident potential at Whiteman AFB, showing land uses that are compatible or incompatible. Noise guidelines are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, *Guidelines for Considering Noise in Land Use Planning and Control*. The U.S. Department of Transportation publication, *Standard Land Use Coding Manual (SLUCM)*, has been used for identifying and coding land use activities.

### 3.3 Participation in the Planning Process

As local communities prepare their land use plans, the Air Force must be ready to provide additional inputs. The Base Civil Engineer is the official liaison with the local community on all planning matters. This office is prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or maybe affected by, Whiteman AFB.

**Figure 4 LAND USE COMPATIBILITY**

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES			
SLUCM NO.	NAME	CLEAR ZONE	APZ I	APZ II	65-70	70-75	75-80	80+
10	<b>Residential</b>							
11	Household units							
11.11	Single units; detached	N	N	Y <sup>1</sup>	A <sup>11</sup>	B <sup>11</sup>	N	N
11.12	Single units; semidetached	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
11.13	Single units; attached row	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
11.21	Two units; side-by-side	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
11.22	Two units; one above the other	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
11.31	Apartments; walk up	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
11.32	Apartments; elevator	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
12	Group quarters	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N
13	Residential hotels	N	N	N	A <sup>11</sup>	B <sup>11</sup>	N	N

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LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES			
SLUCM NO.	NAME	CLEAR ZONE	APZ I	APZ II	65-70	70-75	75-80	80+
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A <sup>11</sup>	B <sup>11</sup>	C <sup>11</sup>	N
16	Other residential	N	N	N <sup>1</sup>	A <sup>11</sup>	B <sup>11</sup>	N	N
20	<b>Manufacturing</b>							
21	Food & kindred products; manufacturing	N	N <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
22	Textile mill products; manufacturing	N	N <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N <sup>2</sup>	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
	<b>Leather and similar materials; manufacturing</b>							
24	Lumber and wood products (except furniture); manufacturing	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
25	Furniture and fixtures; manufacturing	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
26	Paper & allied products; manufacturing	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
27	Printing, publishing, and allied industries	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
28	Chemicals and allied products; manufacturing	N	N	N <sup>2</sup>	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
29	Petroleum refining and related industries	N	N	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
30	<b>Manufacturing</b>							
31	Rubber and misc. plastic products, manufacturing	N	N <sup>2</sup>	N <sup>2</sup>	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
32	Stone, clay and glass products manufacturing	N	N <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
33	Primary metal industries	N	N <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>

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LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES			
SLUCM NO.	NAME	CLEAR ZONE	APZ I	APZ II	65-70	70-75	75-80	80+
34	Fabricated metal products;manufacturing	N	N <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing	N	N	N <sup>2</sup>	Y	A	B	N
39	Miscellaneous manufacturing	N	Y <sup>2</sup>	Y <sup>2</sup>	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
40	<b>Transportation, communications and utilities</b>							
41	Railroad, rapid rail transit and street railroad transportation	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
42	Motor vehicle transportation	N <sup>3</sup>	Y	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
43	Aircraft transportation	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
44	Marine craft transportation	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
45	Highway & street right-of-way	N <sup>3</sup>	Y	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
46	Automobile parking	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
47	Communications	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	A <sup>15</sup>	B <sup>15</sup>	N
48	Utilities	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>
49	Other transportation communications and utilities	N <sup>3</sup>	Y <sup>4</sup>	Y	Y	A <sup>15</sup>	B <sup>15</sup>	N
50	<b>Trade</b>							
51	Wholesale trade	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
52	Retail trade-building materials, hardware and farm equipment	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
53	Retail trade-general merchandise	N	N <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N
54	Retail trade-food	N	N <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N
55	Retail trade-automotive, marine craft, aircraft and accessories	N	Y <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N

**WHITEMAN AFB, MO**

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES			
SLUCM NO.	NAME	CLEAR ZONE	APZ I	APZ II	65-70	70-75	75-80	80+
56	Retail trade-apparel and accessories	N	N <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N
57	Retail trade-furniture, home furnishings and equipment	N	N <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N
58	Retail trade-eating and drinking establishments	N	N	N <sup>2</sup>	Y	A	B	N
59	Other retail trade	N	N <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N
60	<b>Services</b>							
61	Finance, insurance and real estate services	N	N	Y <sup>6</sup>	Y	A	B	N
62	Personal services	N	N	Y <sup>6</sup>	Y	A	B	N
62.4	Cemeteries	N	Y <sup>7</sup>	Y <sup>7</sup>	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14,21</sup>
63	Business services	N	Y <sup>8</sup>	Y <sup>8</sup>	Y	A	B	N
64	Repair services	N	Y <sup>2</sup>	Y	Y	Y <sup>12</sup>	Y <sup>13</sup>	Y <sup>14</sup>
65	Professional services	N	N	Y <sup>6</sup>	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y <sup>6</sup>	Y	Y	A	B	N
67	Governmental services	N	N	Y <sup>6</sup>	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N <sup>2</sup>	Y <sup>2</sup>	Y	A	B	N
70	<b>Cultural, entertainment and recreational</b>							
71	Cultural activities (including churches)	N	N	N <sup>2</sup>	A*	B*	N	N
71.2	Nature exhibits	N	Y <sup>2</sup>	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N

**WHITEMAN AFB, MO**

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES			
SLUCM NO.	NAME	CLEAR ZONE	APZ I	APZ II	65-70	70-75	75-80	80+
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y <sup>17</sup>	Y <sup>17</sup>	N	N
73	Amusements	N	N	Y <sup>8</sup>	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y <sup>8,9,10</sup>	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y <sup>8</sup>	Y <sup>8</sup>	Y*	Y*	N	N
79	Other cultural, entertainment and recreation	N	Y <sup>9</sup>	Y <sup>9</sup>	Y*	Y*	N	N
80	<b>Resources production and extraction</b>							
81	Agriculture (except livestock)	Y <sup>16</sup>	Y	Y	Y <sup>18</sup>	Y <sup>19</sup>	Y <sup>20</sup>	Y <sup>20,21</sup>
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y <sup>18</sup>	Y <sup>19</sup>	Y <sup>20</sup>	Y <sup>20,21</sup>
82	Agricultural related activities	N	Y <sup>5</sup>	Y	Y <sup>18</sup>	Y <sup>19</sup>	N	N
83	Forestry activities and related services	N <sup>5</sup>	Y	Y	Y <sup>18</sup>	Y <sup>19</sup>	Y <sup>20</sup>	Y <sup>20,21</sup>
84	Fishing activities and related services	N <sup>5</sup>	Y <sup>5</sup>	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y <sup>5</sup>	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y <sup>5</sup>	Y	Y	Y	Y	Y

**LEGEND**

**SLUCM** - Standard Land Use Coding Manual, U.S. Department of Transportation.

**Y** - (Yes) - Land use and related structures are compatible without restriction.

**N** - (No) - Land use and related structures are not compatible and should be prohibited.

**Yx** - (yes with restrictions) - Land use and related structures generally compatible; see notes 1-21.

**Nx** - (no with exceptions) - See notes 1-21.

**NLR** - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures. See Appendix E, Vol II.

**A, B, or C** - Land use and related structures generally compatible; measures to achieve NLR for A (DNL 66-70), B (DNL 71-75), or C (DNL 76-80) need to be incorporated into the design and construction of structures. See Appendix E, Vol II.

**A\*, B\*, and C\*** - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

\* - The designation of these uses as "compatible" in this zone reflects individual federal agency and program consideration of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

## NOTES

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures (See Vol 2, Appendix F).
3. The placing of structures, buildings, or above-ground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7063 and AFIMAN 32-3013 for specific guidance.
4. No passenger terminals and no major above-ground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.
7. Excludes chapels.
8. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11. A. Although local conditions may require residential use, it is discouraged in DNL 66-70 dB and strongly discouraged in DNL 71-75 dB. An evaluation should be conducted prior to approvals, indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones, and that there are no viable alternative locations.  
B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for DNL 66-70 dB and DNL 71-75 dB should be incorporated into building codes and considered in individual approvals. See Appendix E for a reference to updated NLR procedures.  
C. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.
12. Measures to achieve the same NLR as required for facilities in the DNL 66-70 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
13. Measures to achieve the same NLR as required for facilities in the DNL 71-75 dB range must be incorporated into the design and construction of portions of these buildings where

the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

14. Measures to achieve the same NLR as required for facilities in the DNL 76-80 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
15. If noise sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR required for facilities in the DNL 66-70 dB range.
19. Residential buildings require the same NLR required for facilities in the DNL 71-75 dB range.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

## SECTION 4: LAND USE ANALYSIS

### 4.1 INTRODUCTION

Land use planning and control is a dynamic, rather than a static process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, as well as changing public concerns. The planning process accommodates this fluidity in that decisions are normally not based on boundary lines, but rather on more generalized area designations.

Whiteman AFB is primarily in an agricultural area, although some suburban, commercial, and industrial development has occurred around local communities and along major transportation routes. Computer technology has enabled Whiteman AFB to more precisely display its flight tracks and noise contours for land use planning purposes. This same technology has revealed that the base's region of influence extends north and east of the town of Knob Noster.

For the purposes of this study, land use and zoning classifications are as follows:

- Residential. Includes all types of residential activity, such as single and multi-family residences, at densities greater than one unit per acre.
- Commercial. Offices, retail establishments, restaurants and other types of commercial establishments.
- Industrial. Manufacturing, warehouses, and other similar uses.
- Public/Quasi-Public. Publicly owned lands and lands open to public access; including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.
- Recreational. Land designated for recreational activity, including parks, golf courses, and wildlife preserves.
- Open/Agricultural/Low Density. Undeveloped land, agricultural areas, grazing lands, and rural residential activity with less than one dwelling unit per acre.

### 4.2 Existing Land Use

Existing land uses in the vicinity of Whiteman AFB are shown in Figure 5. The compatibility of the existing land use in each of the surrounding communities is discussed in detail in the following subsections.

#### 4.2.1 Johnson County

The majority of unincorporated land in the study area is used in agricultural production. Major crops are corn and soybeans, and secondary crops include sorghum, and wheat. Much of the land in the base vicinity is covered by soils which the Soil Conservation Service has designated as "prime" in accordance with the Farmland Protection Act (7 CFR 171 *et seq*). Some of the land is covered by soils that have been classified as "sensitive" by the state of Missouri. These lands are considered ideal for agriculture, and their conversion to other uses is discouraged. In addition to the farmland other protected land in Johnson County includes Knob Noster State Park a forested 3,500 acre conservation and recreation area, lies immediately west of the base.

Most of the residential activity in unincorporated areas consist of single family homes and farms distributed in a low-density manner. There are also a few trailer parks, most notably south of the city along Route J and just southwest of city limits along Missouri Highway 132.

#### 4.2.2 Pettis County

The Pettis County line is approximately 1.5 miles east of the Whiteman AFB boundary. The only portions of this county expected to be impacted by Whiteman AFB operations are approximately 400 acres located northeast and southeast of the base which are subject to noise in the DNL 65-70 dB range. All of this land is rural/agricultural.

#### 4.2.3 City of Knob Noster

Knob Noster is a rural community located just north of Whiteman AFB. The dominant land use is residential, with some commercial, public, agricultural, and industrial land uses also within the city limits. A residential area on the western edge of the city is subject to flight operations-associated noise with a DNL in the 65-70-dB range and extends into APZ I.

**Figure 5**  
**Generalized Existing Land Use**



#### 4.4 Future Land Use

As illustrated in Figure 7, most of the growth in the near future is expected to occur north and west of the city of Knob Noster, away from noise-impacted areas and APZs. Based on past trends, most future development is expected to consist of incremental, low-density development at the fringes of the city, rather than more compact development in the downtown area (Bucher, Willis, and Ratliff 1992). According to its *1992 Comprehensive Plan*, the city expects its population to increase by approximately 720 people over the next twenty years. During the same period, unincorporated areas of Washington Township are expected to gain an additional 826 people.

**Figure 12**  
**Future Land Use**

## **4.5 Incompatible Land Uses**

### **4.5.1 Noise Zones**

Relatively little encroachment has occurred in the vicinity of Whiteman AFB. The most significant compatibility problem at present deals with approximately ten acres of residential development in APZ I on the approach to Runway 19. About half of this is also subject to a DNL of 75-80 dB . Along McPherson Road in the eastern portion of the city of Knob Noster, there are some mobile homes which are subject to noise in the DNL 65-70 dB range. This violates Air Force land use recommendations as described in the Land Use Compatibility Table (table 6). Additionally, there are some isolated residences in APZ II on the approach to Runway 01 which are subject to a DNL of 75-80 dB .

### **4.5.2 Clear Zones and Accident Potential Zones**

As illustrated in Figure 12, most of the future development is expected to occur away from the area projected to be impacted by operations at Whiteman AFB. If future mission changes alter the noise contours, mobile home developments north of the base along Route J and Highway 23 could be impacted. Also, a new 900 acre subdivision called "The Villages at Whiteman" is being developed east of the base, just outside of the DNL 65-70 dB noise contour. Approximately 600 acres of this is expected to be devoted to residential purposes.

### **4.5.3 Planning Considerations**

AICUZ noise contours describe the noise characteristics of a specific operational environment, and as such, will change if significant operational change is made. Should a new mission be established adding a larger number of airplanes or additional model types, the AICUZ could be amended. The base has revised the 2001 AICUZ Study and has provided flight track, accident potential zones and noise contour information in this report that reflects the most current and accurate picture of aircraft activities.

## SECTION 5: IMPLEMENTATION

The implementation of the AICUZ Study must be a joint effort between the Air Force and the adjacent communities. The Air Force's role is to minimize the impact on the local communities by Whiteman AFB operations. The role of the communities is to ensure that development in the environs is compatible with accepted planning and development principles and practices.

### 5.1 Air Force Responsibilities

In general, the Air Force perceives its AICUZ responsibilities as encompassing the areas of flight safety, noise abatement, and participation in the land use planning process.

Well-maintained aircraft and well trained aircrews do much to assure that aircraft accidents are avoided. Despite the best training of aircrews and maintenance of aircraft, history makes it clear that accidents do occur. It is imperative that flights be routed over sparsely populated areas as much as possible to reduce the exposure of lives and property to a potential accident.

By Air Force regulation, commanders are required to periodically review existing traffic patterns, instrument approaches, weather minima, and operating practices, and evaluate these factors in relationship to populated areas and other local situations. This requirement is a direct result and expression of Air Force policy that all AICUZ plans must include an analysis of flying and flying related activities designed to reduce and control the effects of such operations on surrounding land areas. Noise is generated from aircraft both in the air and on the ground. At Whiteman AFB, noise mitigation practices include routing flight tracks to avoid heavily populated areas, adjusting power settings and climb rates to minimize noise, and restricting night engine maintenance and flight operations to an absolute minimum.

The preparation and presentation of this Whiteman AFB AICUZ update is one phase of the continuing Air Force participation in the local planning process. It is recognized that as the local community updates its land use plans, the Air Force must be ready to provide additional inputs.

It is also recognized that the AICUZ program will be an ongoing activity even after compatible development plans are adopted and implemented. Base personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or may be affected by, Whiteman AFB. Base personnel will also be available to provide information, criteria, and guidelines to state, regional, and local planning bodies, civic associations, and similar groups.

## **5.2 Local Community Responsibilities**

The residents of Johnson and Pettis Counties and the personnel of Whiteman AFB have a long history of working together for mutual benefit. We feel that adoption of the following recommendations will strengthen this relationship, increase the health and safety of the public, and help protect the integrity of the base's flying mission:

Incorporate AICUZ policies and guidelines into the comprehensive plans of Washington Township and the city of Knob Noster. Use overlay maps of the AICUZ noise contours and Air Force Land Use Compatibility Guidelines to evaluate existing and future land use proposals.

Modify existing zoning ordinances and subdivision regulations as necessary to support the compatible land uses outlined in this study.

Ensure height and obstruction ordinances reflect current Federal Aviation Regulation (FAR) Part 77 requirements.

Modify building codes to ensure that new construction within the AICUZ area has the recommended noise level reductions incorporated into the design and construction of these facilities.

Continue to inform Whiteman AFB of planning and zoning actions that have the potential of affecting base operations. Develop a working group representing city planners, county planners, and base planners to meet at least quarterly to discuss AICUZ concerns and major development proposals that could affect airfield operations.